

FORM PTO-1390 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NO. PHD 99,103
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		U.S. Application No. (if known, see 37 CFR 1.5) 09/806560
INTERNATIONAL APPLICATION NO. PCT/EP00/07899	INTERNATIONAL FILING DATE AUGUST 10, 2000	PRIORITY DATE CLAIMED AUGUST 13, 1999
TITLE OF INVENTION PLASMA DISPLAY SCREEN HAVING A REFLECTION LAYER		
APPLICANT(S) FOR DO/EO/US HELMUT BECHTEL ET AL		
<p>Applicant(s) herewith submit to the United States Designated/Elected Office (DO/EO/US) the following items and other information:</p> <ol style="list-style-type: none"> <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. <input type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1). <input type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date. <input type="checkbox"/> copy of the International Application as filed (35 U.S.C. 371 (c)(2)) <ol style="list-style-type: none"> <input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). <input type="checkbox"/> has been transmitted by the International Bureau. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). <input checked="" type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)) <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <ol style="list-style-type: none"> <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). <input type="checkbox"/> have been transmitted by the International Bureau. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. <input type="checkbox"/> have not been made and will not be made. <input type="checkbox"/> A translation of the amendment to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)). <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)). <p>Items 11. to 16. below concern document(s) or information included:</p> <ol style="list-style-type: none"> <input type="checkbox"/> An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98. <input checked="" type="checkbox"/> An assignment document for recording. A separate cover sheet is compliance with 37 C.F.R. 3.26 and 3.31 is included. <input type="checkbox"/> A FIRST preliminary amendment. <input type="checkbox"/> A SECOND OR SUBSEQUENT preliminary amendment. <input type="checkbox"/> A substitute specification. <input type="checkbox"/> A change of power of attorney and/or address letter. <input checked="" type="checkbox"/> Other items or information: <ol style="list-style-type: none"> Sheet of Drawings IDS/PTO + 1 REFERENCE Authorization Pursuant to 37 CFR § 1.136(a)(3) and to Charge Deposit Account 		

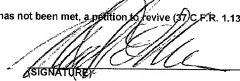
CERTIFICATE OF MAILING

[X] Express Mail Mailing Label No **5L 686 949 025**
 Date of Deposit **March 30, 2001**

I hereby certify that this paper and fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Edna Chapa
 Typed Name

Edna Chapa
 Signature

U.S. APPLICATION NO. (if known, see 37 C.F.R. 1.5) <div style="font-size: 1.5em; font-weight: bold; margin-top: 5px;">09/806560</div>		INTERNATIONAL APPLICATION NO. PCT/EP00/07899		ATTORNEY'S DOCKET NUMBER PHD 99,103																																																																		
17 [X] The following fees are submitted: BASIC NATIONAL FEE (37 C.F.R. 1.492(A)(1)-(5)):				CALCULATIONS (PTO USE ONLY)																																																																		
Search Report has been prepared by the EPO or JPO \$860.00 International preliminary-examination fee paid to USPTO (37 C.F.R. 1.482) \$690.00 No international preliminary examination fee paid to USPTO (37 C.F.R. 1.482) but international search fee paid to USPTO (37 C.F.R. 1.445(a)(2)) \$750.00 Neither international preliminary examination fee (37 C.F.R. 1.482) nor international search fee (37 C.F.R. 1.445(a)(2)) paid to USPTO \$970.00 International preliminary examination fee paid to USPTO (37 C.F.R. 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) \$ 96.00																																																																						
ENTER APPROPRIATE BASIC FEE AMOUNT =																																																																						
Surcharge of \$130.00 for furnishing the oath or declaration later than [] 20 [] 30 months from the earliest claimed priority date (37 C.F.R. 1.492(e)). \$																																																																						
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">CLAIMS</th> <th style="width: 20%;">NUMBER FILED</th> <th style="width: 20%;">NUMBER EXTRA</th> <th style="width: 20%;">RATE</th> <th style="width: 20%;"></th> </tr> </thead> <tbody> <tr> <td>Total Claims</td> <td>4 - 20 =</td> <td></td> <td>X \$ 18.00</td> <td>\$</td> </tr> <tr> <td>Independent claims</td> <td>1 - 3 =</td> <td></td> <td>X \$ 80.00</td> <td>\$</td> </tr> <tr> <td colspan="3">MULTIPLE DEPENDENT CLAIMS (if applicable)</td> <td>+ \$270.00</td> <td>\$</td> </tr> <tr> <td colspan="4" style="text-align: center;">TOTAL OF ABOVE CALCULATIONS =</td> <td>\$ 860.00</td> </tr> <tr> <td colspan="4">Reductions by 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 C.F.R. 1.9, 1.27, 1.28)</td> <td>\$</td> </tr> <tr> <td colspan="4" style="text-align: center;">SUBTOTAL =</td> <td>\$ 860.00</td> </tr> <tr> <td colspan="4">Processing fee of \$130.00 for furnishing the English translation later than [] 20 [] 30 months from the earliest claimed priority date (37 C.F.R. 1.492(f)). +</td> <td>\$</td> </tr> <tr> <td colspan="4" style="text-align: center;">TOTAL NATIONAL FEE =</td> <td>\$</td> </tr> <tr> <td colspan="4">Fee for recording the enclosed assignment (37 C.F.R. 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 C.F.R. 3.28, 3.31). \$40.00 per property +</td> <td>\$ 40.00</td> </tr> <tr> <td colspan="4" style="text-align: center;">TOTAL FEES ENCLOSED =</td> <td>\$ 900.00</td> </tr> <tr> <td colspan="4"></td> <td>Amount to be refunded \$</td> </tr> <tr> <td colspan="4"></td> <td>charged \$</td> </tr> </tbody> </table>						CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		Total Claims	4 - 20 =		X \$ 18.00	\$	Independent claims	1 - 3 =		X \$ 80.00	\$	MULTIPLE DEPENDENT CLAIMS (if applicable)			+ \$270.00	\$	TOTAL OF ABOVE CALCULATIONS =				\$ 860.00	Reductions by 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 C.F.R. 1.9, 1.27, 1.28)				\$	SUBTOTAL =				\$ 860.00	Processing fee of \$130.00 for furnishing the English translation later than [] 20 [] 30 months from the earliest claimed priority date (37 C.F.R. 1.492(f)). +				\$	TOTAL NATIONAL FEE =				\$	Fee for recording the enclosed assignment (37 C.F.R. 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 C.F.R. 3.28, 3.31). \$40.00 per property +				\$ 40.00	TOTAL FEES ENCLOSED =				\$ 900.00					Amount to be refunded \$					charged \$
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE																																																																			
Total Claims	4 - 20 =		X \$ 18.00	\$																																																																		
Independent claims	1 - 3 =		X \$ 80.00	\$																																																																		
MULTIPLE DEPENDENT CLAIMS (if applicable)			+ \$270.00	\$																																																																		
TOTAL OF ABOVE CALCULATIONS =				\$ 860.00																																																																		
Reductions by 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 C.F.R. 1.9, 1.27, 1.28)				\$																																																																		
SUBTOTAL =				\$ 860.00																																																																		
Processing fee of \$130.00 for furnishing the English translation later than [] 20 [] 30 months from the earliest claimed priority date (37 C.F.R. 1.492(f)). +				\$																																																																		
TOTAL NATIONAL FEE =				\$																																																																		
Fee for recording the enclosed assignment (37 C.F.R. 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 C.F.R. 3.28, 3.31). \$40.00 per property +				\$ 40.00																																																																		
TOTAL FEES ENCLOSED =				\$ 900.00																																																																		
				Amount to be refunded \$																																																																		
				charged \$																																																																		
a. [] A check in the amount \$_____ to cover the above fees is enclosed. b. [X] Please charge my Deposit Account No. <u>14-1270</u> in the amount of \$ <u>900.00</u> to cover the above fees. A duplicate copy of this sheet is enclosed. c. [X] The Commissioner is hereby authorized to charge any additional fee, with the exception of the Base Issue Fee, which may be required, or credit any overpayment to Deposit Account No. <u>14-1270</u> . A duplicate copy of this sheet is enclosed.																																																																						
NOTE: Where an appropriate time limit under 37 C.F.R. 1.494 or 1.495 has not been met, a petition to revive (37 C.F.R. 1.137(a) or (b)) must be filed and granted to restore the application to pending status.																																																																						
SEND ALL CORRESPONDENCE TO: Corporate Patent Counsel Philips Electronics North America Corporation 580 White Plains Road Tarrytown, NY 10591																																																																						
 (SIGNATURE)				Michael E. Marion (NAME)																																																																		
32,268 (REGISTRATION NUMBER)																																																																						

s:\brime28brg0.ec0.doc

S:\BRime28brg0.ec0.doc

Plasma display screen having a reflection layer

The invention relates to a plasma display screen comprising a carrier plate, a transparent front plate, a rib structure which divides the space between the carrier plate and the front plate into plasma cells, which are filled with a gas, and comprising one or more electrode arrays on the front plate or on the front plate and the carrier plate to generate corona discharges in the plasma cells, and comprising a phosphor layer and a reflection layer.

The basic principle of a plasma display screen consists in that crossed electrode strips form a matrix, and a gas discharge taking place between them causes pixels to light up. The monochrome versions of the first plasma display screens used the generated light directly. However, as a result of the orange-red color caused by the neon-gas filling, these plasma display screens never became popular and were used only in a very specific market, where their immunity to high magnetic interference fields, mechanical vibrations and extreme temperatures is important, such as in military applications, medical applications, such as NMR diagnostics, and in industrial applications, such as aluminium electrolysis and power station.

Currently, the color versions of the plasma display screens are much more successful than the old monochrome plasma display screens. In the color versions, the gas filling is, for example, a mixture of helium, neon and xenon. In the discharge, ultraviolet radiation is formed which excites phosphors arranged in stripes, causing visible light to be emitted in red, green and blue. The electro-optical efficiency of the color plasma display screens is still unsatisfactory, however, which can be attributed to the fact that a two-stage process is necessary to generate visible light. The efficiency of a plasma display screen comprising a phosphor layer is decisively determined by how completely the generated UV light is absorbed in the phosphor and how completely the generated visible light subsequently leaves the plasma display screen in the direction of the observer. Complete absorption of the generated UV light could be attained by applying the phosphor layer in the largest possible thickness. However, this possibility is limited by the fact that the ribs of the rib structure cannot be manufactured in every desired height, and the available space in the plasma cell is necessary for the gas discharge. Therefore, a substantial part of the UV radiation is customarily transmitted through a comparatively thin phosphor layer and subsequently

absorbed in the carrier plate, without being converted to visible light and without reaching the observer.

In EP 0 782 166 it is disclosed that the luminance of a plasma display screen can be increased by providing a reflecting surface on its front side or by providing a plurality of reflecting surfaces on the rear side and/or on the side walls of the plasma cells of the plasma display screen. The reflecting surfaces can be formed, for example, by the polished surfaces of the electrodes.

It is an object of the invention to provide a plasma display screen wherein the efficiency with which visible light issues from the plasma cells is increased, while unnecessary light losses are precluded and the luminance of the plasma display screen is improved.

In accordance with the invention, this object is achieved by a plasma display screen comprising a carrier plate, a transparent front plate, a rib structure which divides the space between the carrier plate and the front plate into plasma cells, which are filled with a gas, and comprising one or more electrode arrays on the front plate or on the front plate and the carrier plate to generate corona discharges in the plasma cells, and comprising a phosphor layer and a reflection layer, which reflection layer contains a non-metallic powder having a refractive index for the wavelength range from 147 nm to 700 nm of $n = n_{\text{real}} + ik$, where $n > 1.3$ and $k < 0.05$, said powder having an average grain diameter of $100 \text{ nm} < d < 1000 \text{ nm}$. "i" is the mathematical symbol for the imaginary unit.

Such a layer serves as a reflection layer for UV radiation and visible light in the wavelength range from 147 to 700 nm. The UV photons which upon passing through the phosphor layer for the first time have not excited the phosphors so as to make them light up, are reflected and pass through the phosphor layer again, until they are either absorbed or leave the phosphor layer again. In this manner, the probability of UV radiation being absorbed and visible light being excited in the phosphor layer is increased substantially. The conversion of UV radiation to visible light is improved. By virtue of the fact that the material in the reflection layer is in the form of a powder having an average grain diameter of $100 \text{ nm} < d < 1000 \text{ nm}$, said material spreads the light in all directions and the diffuse reflection of the layer is very advantageously improved. Further advantages of such a layer are that a) phosphors having a larger grain size distribution can be used without this necessarily leading to an increased thickness of the layer, which has a favorable effect on the plasma-discharge efficiency, b) a reduction of phosphor in the phosphor layer leads to a reduction of costs and c) the electrical properties of the plasma cells can be more

satisfactorily adapted and, in particular, the voltage range wherein all plasma cells can be switched on and off is optimized.

Within the scope of the invention, it is preferred that the reflection layer has a layer thickness $s > 1 \mu\text{m}$.

5 It is particularly preferred that the gas comprises xenon and that the non-metallic powder is selected from the group formed by MgF_2 , MgO , SiO_2 and Al_2O_3 . These materials reflect UV light which has a wavelength of 147 to 200 nm and which originates, for example, from a xenon gas discharge.

10 It may also be preferred that the reflection layer is a multilayer, enabling the reflection at the layer to be increased.

These and other aspects of the invention will be apparent from and elucidated with reference to the embodiments described hereinafter.

In the drawings:

15 Fig. 1 is a diagrammatic, cross-sectional view of the structure of a AC plasma display screen in accordance with the invention.

Light excitation caused by the UV radiation of a gas discharge is the basic principle of all types of plasma displays. Plasma displays can be divided into DC addressed display screens and AC addressed display screens. The difference between them relates to the way in which current limitation takes place.

20 Fig. 1 shows an example of a plasma cell of an AC plasma display. Such an AC plasma display screen is composed of a transparent front plate 1 and a carrier plate 2, which are kept at a distance from each other and are hermetically closed at the periphery. The space between the two plates forms the discharge space 3, which is bounded by the protective layer and the phosphor layer. Customarily, both the front plate and the carrier plate are made of glass. Individually drivable plasma cells are formed by a rib structure 13 of dividing ribs. A plurality of transparent picture electrodes 6, 7 are arranged in strips on the front plate. The associated control electrodes 11 are provided on the carrier plate at right angles to said picture electrodes, thus enabling a discharge to be ignited at every crossing point.

25 The discharge space is filled with a suitable discharge gas, for example xenon, 30 a xenon-containing gas, neon or a neon-containing gas. The gas discharge is ignited between the picture electrodes 6, 7 on the front plate. To preclude direct contact between the plasma and the picture electrodes 6, 7, the latter are covered with a dielectric layer 4 and a protective layer 5. In the discharge zone, the gas is ionized and a plasma 9 is formed, which emits UV radiation 12. The emitted UV radiation excites pixel-structured red, green and blue phosphors

so as to emit light in the visible region 14, resulting in a perceived color. The pixels of the plasma display screen in the three primary colors red, blue and green are formed by a phosphor layer 10 on at least a part of the carrier plate and/or the walls of the dividing ribs in the plasma cells. The reflection layer 8 is arranged between the rear side of the phosphor layer and the carrier plate, and reflects the UV radiation which has not been absorbed in the phosphor layer, such as visible light. The reflection layer particularly reflects light in the wavelength range between 147 and 700 nm. In the embodiment in accordance with Fig. 1, the reflection layer 8 also extends on the side walls of the plasma cells between the phosphor layer 10 and the ribbed structure 13. It is not necessary, however, for the reflection layer to cover the entire rear wall or the entire side walls of the plasma cells. It is sufficient if the rear wall and/or the side walls are at least partly covered.

Such a reflection layer comprises a non-metallic powder having a refractive index for the wavelength range from 147 nm to 700 nm of $n = n_{\text{real}} + ik$, where $n > 1.3$ and $k < 0.05$, said non-metallic powder having an average grain diameter of $100 \text{ nm} < d < 1000 \text{ nm}$. Such a reflection layer can be formed, for example, by a layer of a powder composed of MgF_2 , MgO , SiO_2 or Al_2O_3 having the appropriate granularity.

The reflection layer may alternatively be composed of several layers of non-metallic powders of the type mentioned hereinabove, having matching refractive indices, to increase the reflection. It is preferred that the grain diameter of the layers decreases in the direction of the carrier plate in order to obtain layers having an optically increasing density.

Dependent upon the composition of the gas in the plasma cell, the spectral intensity of the gas discharge changes. Gas mixtures comprising less than 30 vol.% xenon emit substantially resonant radiation at 147 nm, gas mixtures comprising more than 30 vol.% xenon emit excimer radiation at 172 nm. A particularly high efficiency of the reflection is obtained when the material used for the reflection layer is adapted, as regards chemical composition, layer thickness s and grain diameter d in accordance with Table 1 and Table 2, to the spectral intensity of the UV radiation. For UV light of a longer wavelength, use is preferably made of powders having a larger grain diameter.

Table 1: Spectral intensity maximum at 147 nm

Material	Average Diameter $d_{50\%}$ [nm]	Layer thickness [μm]	Reflection (147 nm)	Reflection (550nm)
SiO ₂	500	2.0	74%	76%
	250	2.0	90%	72%
	250	5.0	95%	87%
	100	2.0	97%	50%
MgF ₂	250	2.0	86%	60%

5 Table 2: Spectral intensity maximum at 170 nm

Material	Average Diameter $d_{50\%}$ [nm]	Layer thickness [μm]	Reflection (170 nm)	Reflection (550nm)
Al ₂ O ₃	250	2.0	40%	80%
MgO	250	1.0	78%	70%
	500	2.0	75%	83%
	250	5.0	90%	90%

To manufacture the reflection layer use can be made of dry coating methods, for example electrostatic deposition or electrostatically assisted dusting, as well as wet coating methods, for example screen printing, dispenser methods, wherein a suspension is introduced using a nozzle moving along the channels, or sedimentation from the liquid phase.

For the wet coating methods, the pigments must be dispersed in water, an organic solvent, if necessary in combination with a dispersing agent, a surface-active agent and a defoaming agent or a binder additive. Organic and inorganic binders capable of withstanding an operating temperature of 250 °C without decomposing, embrittling or discoloring can suitably be used as the binder additives for plasma display screens.

Although the invention has been described with reference to an AC color plasma display screen, the application of the invention is not limited to this type of plasma display screen, but also includes, for example, DC color plasma display screens and monochromatic AC and DC plasma display screens.

CLAIMS:

1. A plasma display screen comprising a carrier plate, a transparent front plate, a rib structure which divides the space between the carrier plate and the front plate into plasma cells, which are filled with a gas, and comprising one or more electrode arrays on the front plate or on the front plate and the carrier plate to generate corona discharges in the plasma cells, and comprising a phosphor layer and a reflection layer, characterized in that the reflection layer contains a non-metallic powder having a refractive index for the wavelength range from 147 nm to 700 nm of $n = n_{\text{real}} + ik$, where $n > 1.3$ and $k < 0.05$, said powder having an average grain diameter of $100 \text{ nm} < d < 1000 \text{ nm}$.

2. A plasma display screen as claimed in claim 1, characterized in that the reflection layer has a layer thickness $s > 1 \text{ } \mu\text{m}$.

3. A plasma display screen as claimed in claim 1, characterized in that the gas comprises xenon and that the non-metallic powder is selected from the group formed by MgF_2 , MgO , SiO_2 and Al_2O_3 .

4. A plasma display screen as claimed in claim 1, characterized in that the reflection layer is a multilayer.

1/1

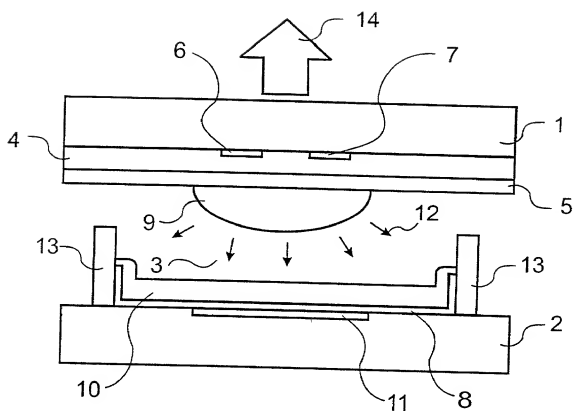


FIG. 1

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY
(Includes Reference to PCT International Applications)

ATTORNEY'S DOCKET
NUMBER
PHD 99.103 US

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **"Plasma display screen having a reflection layer"**
the specification of which (check only one item below):

☐ is attached hereto.

☐ was filed as United States application

Serial No _____

on _____

and was amended

on _____

☒ was filed as PCT international application

Number PCT/EP00/07899

on 10 August 2000

and was amended under PCT Article 19

on _____

(if applicable).

☒ hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

COUNTRY	APPLICATION NUMBER	DATE OF FILING DAY, MONTH, YEAR	PRIORITY CLAIMED UNDER 35 USC 119
Germany	19938355.3	13 August 1999	YES

Combined Declaration For Patent Application and Power of Attorney (Continued)
(Includes Reference to PCT International Applications)

Attorneys Docket Number
PHD 99.103 US

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (List name and registration number)

Algy Tamoshunas Reg. No. 27,677
Jack E. Haken, Reg. No. 26,902

Direct Telephone Calls to:
(name and telephone number)
(914)332-0222

1-0	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
201	RESIDENCE & CITIZENSHIP	BECHTEL	Helmut	
	POST OFFICE ADDRESS	Roetgen	Germany	Germany
		Offermannstrasse 30	52159 Roetgen	Germany
2-0	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
202	RESIDENCE & CITIZENSHIP	ELTS	Johann	
	POST OFFICE ADDRESS	Aachen	Germany	Germany
		Schmithofer Strasse 58	52076 Aachen	Germany
3-0	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
203	RESIDENCE & CITIZENSHIP	GLASER	Harald	
	POST OFFICE ADDRESS	Aachen	Germany	Germany
		Maria-Therisia-Allee 89	52064 Aachen	Germany
4-0	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
204	RESIDENCE & CITIZENSHIP	NIKOL	Hans	
	POST OFFICE ADDRESS	Aachen	Germany	Germany
		Luisenstrasse 26	52070 Aachen	Germany
	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
205	RESIDENCE & CITIZENSHIP			
	POST OFFICE ADDRESS			

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201 CITY	SIGNATURE OF INVENTOR 202	SIGNATURE OF INVENTOR 203
<i>Helmut Bechtel</i>	<i>Johann Elts</i>	<i>Harald Glaser</i>
DATE 8 March 2001	DATE 8 March 2001	DATE 8 March 2001
SIGNATURE OF INVENTOR 204	SIGNATURE OF INVENTOR 205	
DATE	DATE	

U.S. DEPARTMENT OF COMMERCE- Patent and Trademarks Office

(July 1994)

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY
(Includes Reference to PCT International Applications)

ATTORNEY'S DOCKET
NUMBER
PHD 99.103 US

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **"Plasma display screen having a reflection layer"**
the specification of which (check only one item below):

☐ is attached hereto.

☐ was filed as United States application

Serial No _____

on _____

and was amended

on _____

☒ was filed as PCT international application

Number PCT/EP00/07899

on 10 August 2000

and was amended under PCT Article 19

on _____ (if applicable).

☒ I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

☒ I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

☒ I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

COUNTRY	APPLICATION NUMBER	DATE OF FILING DAY, MONTH, YEAR	PRIORITY CLAIMED UNDER 35 USC 119
Germany	19938355.3	13 August 1999	YES

U.S. DEPARTMENT OF COMMERCE - Patent and Trademarks Office
(July 1994)

Combined Declaration For Patent Application and Power of Attorney (Continued)
(Includes Reference to PCT International Applications)

Attorneys Docket Number
PHD 99.103 US

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (List name and registration number)

Algy Tamoshunas Reg. No. 27,677
Jack E. Haken, Reg. No. 26,902

Direct Telephone Calls to:
(name and telephone number)
(914)332-0222

201	FULL NAME OF INVENTOR	FAMILY NAME BECHTEL	FIRST GIVEN NAME Helmut	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY Roetgen	STATE OR FOREIGN COUNTRY Germany	COUNTRY OF CITIZENSHIP Germany
	POST OFFICE ADDRESS	POST OFFICE ADDRESS Offermannstrasse 30	CITY 52159 Roetgen	STATE & ZIP CODE/COUNTRY Germany
202	FULL NAME OF INVENTOR	FAMILY NAME EILTS	FIRST GIVEN NAME Johann	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY Aachen	STATE OR FOREIGN COUNTRY Germany	COUNTRY OF CITIZENSHIP Germany
	POST OFFICE ADDRESS	POST OFFICE ADDRESS Schmithofer Strasse 58	CITY 52076 Aachen	STATE & ZIP CODE/COUNTRY Germany
203	FULL NAME OF INVENTOR	FAMILY NAME GLASER	FIRST GIVEN NAME Harald	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY Aachen	STATE OR FOREIGN COUNTRY Germany	COUNTRY OF CITIZENSHIP Germany
	POST OFFICE ADDRESS	POST OFFICE ADDRESS Maria-Therisia-Allee 89	CITY 52064 Aachen	STATE & ZIP CODE/COUNTRY Germany
204	FULL NAME OF INVENTOR	FAMILY NAME NIKOL	FIRST GIVEN NAME Hans	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY Aachen	STATE OR FOREIGN COUNTRY Germany	COUNTRY OF CITIZENSHIP Germany
	POST OFFICE ADDRESS	POST OFFICE ADDRESS Luisenstrasse 26	CITY 52070 Aachen	STATE & ZIP CODE/COUNTRY Germany
205	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201 CITY	SIGNATURE OF INVENTOR 202	SIGNATURE OF INVENTOR 203
DATE	DATE	DATE
SIGNATURE OF INVENTOR 204 <i>Hans Nikol</i>	SIGNATURE OF INVENTOR 205	
DATE 8 March 2001	DATE	

U.S. DEPARTMENT OF COMMERCE - Patent and Trademarks Office

(July 1994)